REMARKS

This is the first office action. Claims 1-22 are pending with this response. Claims 1-22 are rejected by this office action. The Applicant is canceling claim 14.

Typographical Errors

The Applicant has amended claims 1-18 to replace "a" with "A" to correct a typographical error. The Applicant has added "and" before the last feature of claim 1.

35 USC §112

Claim 20 is rejected by the Office Action under 35 USC 112, second paragraph. The Office Action alleges that "Claim 20 recites the limitation 'said at least two receiving chaotic oscillators' in line 2 of claim. There is insufficient antecedent basis for this limitation in the claim." The Applicant has amended claim 20 to refer to "said at least two oscillating regimes". Thus, the Applicant requests reconsideration of claim 20.

Priority

The Office Action states that the present application must contain a specific reference to the prior application in the first sentence of the specification in order to obtain the benefits of the earlier application. The Applicant has amended the specification by providing the required information in the first sentence of the specification. The Applicant claimed priority to 09/116,661 in the Declaration as originally filed.

35 USC §103

Claims 1-6 are rejected by the Office Action under USC 103(a) as being unpatentable over US 5,857,165 (Corron) in view of US 5,291,555 (Cuomo). Regarding claim 1, the Office Action admits that Corron does not explicitly teach "a component element being isolated from said chaotic circuit by a switch such that when said switch is switched to a first state, said value has a first magnitude and when said switch is switched to a second state, said value has a second magnitude." The Office Action further alleges that Cuomo "discloses such a switch for modulation of a signal (col 4 ln 8-43), wherein said switch being controllable responsively to an

information signal (v_{in}, col 4 ln 35-43). The Applicant has amended claim 1 to include the feature of "said switch being controllable responsibly to an information signal **without transforming said information signal**, whereby said chaotic carrier signal is modulated by said information signal". (Emphasis added.) As amended, Cuomo does not teach this feature. For example, Figure 3 of Cuomo (as discussed in col 4 ln 8-43) teaches that the information signal (v_{in}) is transformed (through VCO 310, COMP 320, COMP 321, and COMP 322) in order to control switch 330. Claims 2-6 depend from claim 1 and are patentable for at least the above reasons. Cuomo does not teach or even suggest this feature. Thus, the Applicant requests reconsideration of claims 1-6.

Claim 7-21 are rejected by the Office Action under 35 USC 103(a) as being unpatentable over Corron. The Office Action alleges that Corron teaches "a transmitting chaotic circuit configurable responsively to an information signal (col 3 ln 38-46) such that said transmitting chaotic circuit produces at least three different chaotic signals (lambda specifying a different state of the system. Corron further discloses both discrete and continuous variation of lambda, and hence at least three chaotic signals, fig 4 plot 208 and equation 23), each being characterized by a different trajectory versus-time characteristic (time varying lambda, col 3 ln 58-col 4 ln 23, equation 3 and col 7 ln 12-29)". The Applicant has amended claim 7 to include the feature of "a transmitting chaotic circuit configurable responsibly to an information signal such that such transmitting chaotic circuit produces at least three different chaotic signals, each being characterized by a different trajectory-versus-time characteristic **while maintaining a same oscillating regime**". (Emphasis added.) The specification of the present patent application teaches (Page 13, lines 3-5):

> Referring again to Fig. 1D, discussed in the background, the various chaotic oscillating regimes of the Chua circuit are mapped on an α/β parameter plane.

The specification further teaches (Page 22, lines 16-23):

> In the embodiment of Figs. 4a and 4b, instead of modulating the behavior of the transmitting circuit by varying only one component, the values of the combinations of components determining C_1, C_2, R, and L are varied in such a way as to maintain $\alpha=C_2/C1$ and $\beta=R^2C_2/L$ constant under the control of controller 305. That is, values of the auxiliary capacitors, resistors, and inductors

in banks 315, 320, 325, and 330 are chosen so that when predefined combinations of the corresponding opto-isolators are actuated, the oscillating frequency changes (See equation((1), below), but α and β remain the same.

Corron does not teach or even suggest this feature. Moreover, the Office Action alleges that "the office takes official notice that if only digital signals are utilizes [utilized]; the preferred method of demodulation is the use of a beat detector." The Applicant submits that there are many approaches to digital demodulation (e.g., amplitude demodulation, phase demodulation, frequency demodulation) that are applicable to digital signals. The Applicant is requesting that the Examiner reference prior art that provides the teaching alleged by the Office Action. Claims 8-12 ultimately depend from claim 7 and are patentable for at least the above reasons. Regarding claim 12, the Office action alleges that "the values of said inductance, said capacitance, and said resistance, of all of separate configurations are characterized by equal values of alpha=C_1/C_2 and beta=R^2C_2/L (equations 27, col 6 ln 65-col 7 ln 1). Corron merely teaches <u>how to calculate alpha and beta</u> and does not teach or even suggest separate configurations that are characterized by equal values of α and β. Thus, Applicant requests reconsideration of claims 7-12.

Referring to claim 13, the Office Action alleges that Corron discloses "a communications receiver (fig 1, col 3 ln 38-45) and a chaotic portion (LC circuit, fig 2) and a chaotic portion with a non-linear resistance element (noisy diode circuit, fig 2 and fig 3); said oscillator portion and said chaotic portion being coupled to pass a current signal there between (R_5, fig 2, see also fig 3)". The Applicant has amended claim 13 to include the features of "**a synchronizing resistor that couples said oscillator portion and said chaotic portion to pass a current signal therebetween**", a comparator having a first input coupled to said communications channel and a second input coupled to said chaotic portion, wherein **the synchronizing resistor is adjusted so that an output of said comparator is clean and clear,** and wherein the output of said comparator indicates, by nominal zero levels, a difference between a frequency characterizing said modulated chaotic signal and a frequency of said chaotic portion", and "said chaotic portion being coupled to said communications medium through a resistor bridging said first and second inputs of said comparator". (Emphasis added.) For example, the specification of the present patent application teaches (page 25, lines 17-21):

> In the embodiment of Fig. 4c, it has been found, through experiment, that the synchronizing resistor 385 may be adjusted to optimize the ability of the receiver circuit 401 to follow the trajectory of the transmitter signal at portions thereof so that zero levels of the output 390 are clean and clear.

As amended, Corron does not teach or even suggest the features of claim 13. Claims 15-18 depend from claim 13 and are patentable for at least the above reasons. Thus, the Applicant requests reconsideration of claims 13 and 15-18.

Similar to claim 1, the Applicant amended claim 19 to include the feature of "said switch having an input for accepting an information signal and being controllable responsibly to said information signal without transforming said information signal, wherein said effective capacitance does not include said second of said at least two capacitors when said switch is switched to a first state, wherein said effective capacitance includes said second of said at least two capacitors when said switch is switched to a second state, wherein said chaotic oscillator is selectively alternated between at least two oscillating regimes and thereby modulated in accord with said information signal to generate chaotic signal which at each instant oscillates according to a selected one of said oscillating regimes, and wherein a first oscillating regime being associated with said first state of said switch and a second oscillating regime being associated with said second state of said switch". Corron does not teach or even suggest this feature. Moreover, claim 19 includes the features of "said chaotic oscillator having a tank circuit with at least two capacitors and an inductor and having an effective capacitance determined by said at least two capacitors" and "a first of said at least two capacitors being connected to an inductor and a second of said at least two capacitors being selectively connectable to said inductor to combine respective capacitances of said at least two capacitors through a switch, wherein said second of said at least two capacitors is isolated from said chaotic oscillator by said switch". Claim 20 depends from claim 19 and is patentable for at least the above reasons. Thus, the Applicant requests reconsideration of claims 19 and 20.

Regarding claim 21, the Office Action alleges that Corron discloses "a communications system comprising: transmitting and receiving Chua circuits at least one component of said transmitting Chua circuit including at least two subcomponents, at least one of which being selectively isolated from said transmitting Chua circuit by a switch (isolates from the Chua

circuit via an op amp FET switch, fig 2) such that a current oscillating regime of said transmitting Chua circuit is selectively alternated between at least two respective oscillating regimes (if the signal is discrete, states of the oscillators will have at least two states, see fig 4, plot 208". Referring to Figure 2 of Corron, Corron merely teaches (Column 7, lines 24-27. Emphasis added.):

> The system in equation (23) reverts to a standard **unmodulated** Chua system for $\gamma=0$ and $\lambda=0$. In the circuit of FIG. 2, this is easily obtained by removing R4 and effectively realizing an infinite resistance for R_4.

In the above teaching, R_4 may be removed (presumably by a switch) in order to merely block an information signal (V_R and V_L as shown in fig. 2) from reaching the Chua circuit and not selecting one of at least two oscillating regimes. However, Corron does not teach "values of said at least two subcomponents together with a configuration of said switch being such that one of said at least two oscillating regimes is substantially the same as an oscillating regime of said receiving Chua circuit, whereby said receiving Chua circuit is synchronizable with said transmitting Chua circuit when said current oscillating regime is said one of said at least two oscillating regimes". Thus, the Applicant requests reconsideration of claim 21.

Claim 22 is rejected by the Office Action under 35 USC 103(a) as being unpatentable over Corron in view of US 5,379,346 (Pecora). The Office Action admits that "Corron et al does not explicitly teach said receiver having a decoder connected to derive a received second signal by comparing said received second signal to a signal inhering in said receiver." The Office Action alleges that Pecora teaches this deficiency. The Applicant has amended claim 22 to include the feature of "said receiver having a decoder connected to derive a received information signal from said received second signal by comparing said received second signal, **without transforming said received second signal,** to a signal inhering in said receiver". (Emphasis added.) For example, Figure 5 of the present patent application shows signal S2 (which is received from transmitter 780) being compared (comparator 740) with signal S4 to extract the received signal. However, Pecora (figure 5, col. 10, line 55 – column 11, line 11) merely teaches comparing signals (the output of AM demodulator 290 and the output of FM demodulator 292) inhering in the receiver. Thus, the Applicant requests reconsideration of claim 22.

CONCLUSION

Favorable reconsideration of this application is respectfully requested. The Examiner is invited to contact the undersigned should it be deemed necessary to facilitate prosecution of the application.

Respectfully submitted,

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